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SPECTRUM OF SUICIDAL BEHAVIOURS IN EDINBURGH

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Until a few years ago, suicides and attempted suicides were regarded as a homogeneous group. Stengel, Cook, and Kreeger (1958) pointed out that they are two different but overlapping populations. The 'overlap' has been demonstrated by follow-up studies of attempted suicide which reveal only a small proportion who later committed suicide (0·3% to 22% depending upon the duration of follow-up), and by retrospective studies on completed suicides showing that only a small proportion of these had made previous attempts (8·6% to 33·3% in any unselected and consecutive series of suicides) (Dorpat and Ripley, 1967). Investigation of the full spectrum of suicidal behaviour requires the integration of detailed data on both suicides and attempted suicides occurring in the same population over the same period of time. The majority of researchers have studied the two patterns of behaviour in different populations or in different areas or at different times with ensuing problems of interpretation. Those few studies making a contemporaneous comparison have been restricted by difficulties in representative sampling among the attempted suicide population (Schmid and Van Arsdol, 1955, in Seattle; Farberow and Schneidman, 1961, in Los Angeles; Stengel *et al.*, 1958, in London; Ropschitz and Ovenstone, 1968, in Halifax). This occurred either because the studies were carried out at a time when suicidal behaviour was a legal offence, as in London and Seattle, and precautions would be taken to conceal all but the most serious attempts, or the data were based on hospitalized cases and therefore likely to be biased towards persons requiring admission. The Los Angeles study did, however, include cases notified to them by the community physicians (from whom they had a 70% response) and achieved what they called 'a fair but undoubtably conservative figure' for attempted suicides occurring over their research period. Sampling presents less difficulty in Edinburgh as 98% of all suicidal attempts sent to, or presenting at, hospitals in the area are admitted to the Regional Poisoning Treatment Centre (RPTC) no matter how trivial the attempt. It has been demonstrated that 80% of the cases seen in general practice are also admitted and that the RPTC population is representative of those attempting suicide in Edinburgh (Kennedy, 1971).

In most studies data relating to completed suicides have been obtained from coroners' records, which it is accepted under-report the problem. However, of more fundamental importance is the question whether under-reporting materially alters the characteristics of the suicide population. On this issue, a previous paper put forward the rationale for adopting a psychiatric instead of a legal approach to the matter of diagnosis (Ovenstone, 1972). However, a comparison of the two methods carried out on a series of Edinburgh deaths revealed that, to all intents and purposes, the officially recorded suicides provided a representative picture. Further analysis of those suicides ascertained by psychiatric means demonstrated that they were sub-divisible into two almost equal groups, distinguished on the basis of the presence or absence of a previous suicidal attempt or 'parasuicide'. Their characteristics have been fully described in a separate paper (Ovenstone and Kreitman, in preparation).

The present paper compares the same series of suicides, on a limited number of variables, with a group of attempted suicides admitted to the RPTC contemporaneously, to ascertain the common determinants of both types of behaviour, those factors which differentiate them, and the nature of the 'overlap'.

METHOD

COLLECTION OF SUICIDE DATA

The Edinburgh Crown Office receives reports from the area Procurator Fiscals in certain cases of death. Broadly speaking, these are those where the circumstances point to suicide, those arising from the use of a vehicle, gas poisonings, and where the possibility of criminal proceedings may arise or a public enquiry ensue. Over a period of 18 months all deaths reported to the Crown Office (excluding those due to natural causes) of persons aged 12 years and upwards, where the deceased had a resident address in Edinburgh at the time of death, were examined. The information from the official

reports was recorded on a prepared schedule. Additional data were collected on those deaths recorded as suicide by the Crown Counsel and other deaths where the circumstances pointed to suicide together with certain specified accidental deaths described elsewhere (Ovenstone, 1972). These data related to medical contacts, the family, and the personal and social background of the deceased. They were obtained by screening the records of the RPTC and the mental hospital inpatient and outpatient notes in the Edinburgh area, and other areas where relevant, and the records of the deceased's general practitioner, who was contacted to fill in details if information was incomplete. The Samaritans affirmed previous attendances at their service where relevant and the City Assessor provided details concerning housing. From all the assembled information the death was allotted to the category of suicide, accidental death, or 'undetermined', i.e., 'injury undetermined whether accidentally or purposely inflicted', according to certain criteria. These have been detailed in a separate paper (Ovenstone, 1972). Suicide was defined as a deliberate initiation of an act of self-poisoning or self-injury which resulted in death irrespective of whether there was evidence of intent to die. Other evidence taken into consideration before reaching a diagnosis covered the manner of death, previous intimation of intent, previous patterns of suicidal behaviour, and maladaptation to recent and remote stress situations.

Collection of Attempted Suicide Data

Over the same 18-month period data were obtained from the RPTC records on all persons aged 12 years and upwards with a resident Edinburgh address at the time of the act. A person who was admitted more than once during the period was counted for the first admission only. The data referred only to intentional self-poisoning and self-injury, accidental and other cases being discounted.

Sample Sizes The sample consisted of 1,141 cases of attempted suicide (433 males and 708 females) and 106 cases of suicide (56 males and 50 females), divisible into the previous attempt (PA) group (the 'overlap'), comprising 50 cases, and the 'no previous attempt' (NPA) group of 56 cases.

Results

As the information on attempted suicides was less comprehensive than that obtained for suicides, the comparisons were limited by the number of variables common to both groups. The findings were analysed in two parts. Firstly, the attempted suicides and the whole group of suicides were compared to ascertain the common determinants and distinguishing features of both groups. Secondly, a triple comparison was made between the attempted suicides, the suicides (PA) group, and the suicides (NPA) group. This was done in order to define the characteristics of the suicides (PA) group or 'overlap' in relation to the other two groups.

Comparisons between Attempted Suicides and Suicides

Incidence Table I shows that the rates for attempted suicide greatly exceeded those for suicide, particularly in females.

Age and Sex Attempted suicides were predominantly females (ratio F:M 1·64:1). The suicides were more evenly represented by both sexes (ratio M:F 1·12:1). The difference between the groups was statistically significant ($\chi^2 = 9$; df = 1; $P < 0{\cdot}005$). Attempted suicides were characteristically young while the suicides were older, the difference being highly significant (Table II). The data are

Table I

Comparison of Annual Rates per 100,000 Population: Attempted Suicides and Suicides

	Attempted Suicides Annual Rate/100,000	Suicides Annual Rate/100,000	Ratio AS/S
Males ..	135·2	17·5	7·7 : 1
Females ..	189·7	13·4	14·2 : 1
Total ..	164·5	15·3	10·8 : 1

Rates based on the population for the city of Edinburgh (all ages) (Registrar General, 1966).

Table II

Age and Sex Distribution of Attempted Suicides and Suicides

Age Group	Attempted Suicides		Suicides	
	Males	Females	Males	Females
<19	67	133	1	0
20-24	90 (57·5%)	123 (59·7%)	3 (23·2%)	2 (14·0%)
25-34	92	167	9	5
35-44	67	119	7	2
45-54	62	86	11	15
55-64	31 (42·5%)	47 (40·3%)	17 (76·8%)	16 (86·0%)
65+	24	33	8	10
All ages ..	433	708	56	50

χ^2 (age distribution, males) = 47·7; df = 6; $P<0{\cdot}001$
χ^2 (age distribution, females) = 89·7; df = 6; $P<0{\cdot}001$

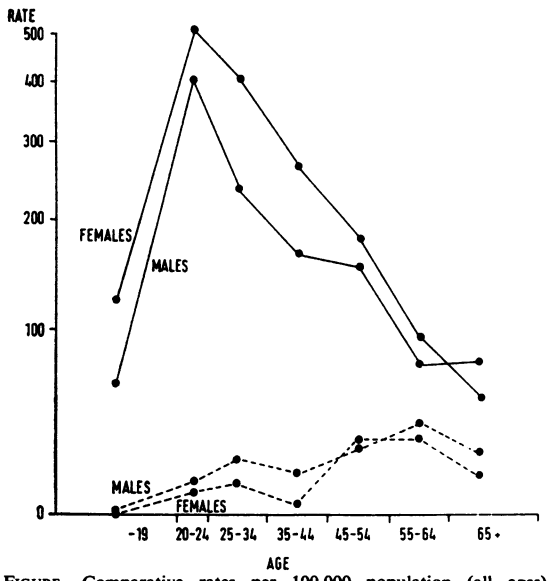

FIGURE. Comparative rates per 100,000 population (all ages) - - - suicides; —— attempted suicides.

more clearly expressed as rates based on the city of Edinburgh (Registrar General, 1966) shown in the Figure. Peak rates for both male and female attempted suicides occurred in the 20-24 years age group while those for suicides lay between 55 and 64 for males, and between 45 and 64 for females. Thereafter the suicides showed a downward trend in the 65 years and over group.

SOCIAL FEATURES Those social factors significantly discriminating the two groups are summarized in Table III. The previous table indicated that age should be held constant while examining the civil state categories. Below 45 years attempted suicides were mainly single, while suicides were more often separated, divorced, or widowed. Over this age there was no significant difference. The patterns were similar for both sexes, although the numbers were too small to control for age and sex simultaneously. Differences in household composition reflect the preponderance of suicides who lived alone, the principal reasons being widowhood followed by separation or divorce. Unemployment or premature retirement was more characteristic of male suicides and was due mainly to psychiatric morbidity, which covered all forms of psychiatric disturbance including personality disorder. The data did not permit analysis of the reasons for unemployment among attempted suicides. A history of criminal behaviour did not differentiate the groups as a whole although, as will be shown later, it was a distinguishing feature of the 'overlap'. Overcrowding was not a particular feature of either group, occurring in 20% of the attempted suicides and in 15·9% of the suicides.

METHOD Drugs were taken almost exclusively by the attempted suicides while the suicides more often employed carbon monoxide and self-injury to commit the act (Table III). While similar patterns of behaviour pertained among both sexes in the attempted suicide group, the male suicides more

TABLE III

FACTORS DIFFERENTIATING ATTEMPTED SUICIDES (N = 1141) AND SUICIDES (N = 106)

Factor	Attempted Suicides %		Suicides %		Significance of Difference between Attempted Suicides and Suicides	
	<45 yr	45 yr+	<45 yr	45 yr+		
Civil state						
Single	43·8	10·6	27·6	12·9		
Married	39·5	56·5	37·9	41·5	<45 yr	P<0·025
Separated, widowed or divorced	15·9	32·5	34·5	45·5	45 yr+	P<0·1
Not known	0·7	0·4	—	—		
	Males	Females	Males	Females		
Household composition						
Alone	10·2	8·5	26·8	36·0	Males	P<0·001
Spouse/Other	86·8	90·1	73·2	64·0	Females	P<0·001
Not known	3·0	1·4	—	—		
Alcohol taken at time of act	55·0	25·4	41·1	30·0	Males	P<0·05
Not known	1·6	1·8	—	—	Females	P n.s.
Unemployment/retirement Males 16-65 yr only	42·0		64·5			P<0·01
Method (both sexes)						
Drugs	94·9		63·2			
Carbon monoxide	2·9		15·1			
Injury	1·1		21·7			P<0·001
Not known	1·1		—			

TABLE IV

SOCIAL CLASS DISTRIBUTION: ATTEMPTED SUICIDES AND SUICIDES (MALES)

Social Class	Attempted Suicides Annual Rate per 100,000 population	Suicides Annual Rate per 100,000 population
I and II	92·2	21·9
III	100·8	16·1
IV	261·5	40·9
V	568·4	51·3

Rates based on population of economically active and retired males (Registrar General, 1966)

commonly employed self-injury and the female suicides drugs. The numbers were too small, however, to verify these comparisons statistically. Alcohol in association with the act more frequently occurred in male attempted suicides, there being little difference in the females (Table III).

SOCIAL CLASS The highest rates in both groups came from social classes IV and V, the same pattern holding true for male suicides both under and over 65 years of age (Table IV).

CITY WARD RATES Rates for each of the 23 wards of the City of Edinburgh were calculated for both the attempted suicides and the suicides. Spearman rank order correlations for the two rates across the city wards was $r_s = 0{\cdot}58$, showing a moderate similarity between the two rankings. The six wards with the highest rates for both groups were listed in order and the distributions were found to be essentially similar. The highest rates occurred in the central areas characterized by poor housing and social disintegration and more peripherally in the post-war re-housing centres containing high levels of social pathology.

ECOLOGICAL FEATURES The data for the social variables were those obtained by Philip and McCulloch (1966) for the city of Edinburgh, between 1965 and 1966, except for those relating to overcrowding and single-person households which were obtained from the 1966 Census. Spearman rank order correlation coefficients were calculated between the social variables and the city ward rates. Table V shows those correlations on which significant results were obtained. Both attempted suicides and suicides correlated with the same social variables apart from adolescent self-poisoning and injury. In general the attempted suicides correlated with the social variables at a higher level than the suicides. No significant correlations were found in the other variables used, namely adolescent psychiatric referral, eviction notices, peace warnings, rent arrears, infant mortality, stillbirths, or single-person households.

TABLE V

SPEARMAN RANK CORRELATIONS: ATTEMPTED SUICIDES AND SUICIDES BASED ON CITY WARDS RATES AND SOCIAL VARIABLES

Social Variable	Attempted Suicides Spearman Rank Correlation	Suicides Spearman Rank Correlation
1 Adolescent — self-poisoning and injury	0·40	0·44*
2 All ages — self-poisoning and injury	0·80***	0·54**
3 Juvenile delinquency	0·76***	0·59**
4 Children taken into care	0·80***	0·44**
5 Overcrowding ..	0·62**	0·48*
6 School absences other than sickness	0·61**	0·49*
7 RSSPCC referrals..	0·76***	0·57**

* $P < 0{\cdot}05$ (two-tailed tests)
** $P < 0{\cdot}01$
*** $P < 0{\cdot}001$

PSYCHIATRIC FACTORS The psychiatric factors significantly differentiating the groups are shown in Table VI. For females the proportion who had received psychiatric in-patient care was almost twice as great for suicides as for attempted suicides. There was little difference for males. Compared with the attempted suicides a higher proportion of both male and female suicides had received out-patient psychiatric care.

Alcoholic abuse was more characteristic of suicides than of attempted suicides for males and females*.

A very high proportion of the suicides were depressed, while many of the attempted suicides showed 'no formal psychiatric illness' at the time of the act.†

Drug addiction and alcoholism were collectively more common as a personality diagnosis among the suicides compared with 'normal personality' among the attempted suicides.‡

* To obtain this information for the suicides all available records were used which indicated that the deceased drank to excess, was addicted to alcohol, or suffered from chronic alcoholism.

† The psychiatric diagnosis in the attempted suicides was detected from either the history or clinical examination. If all information about a patient's mental state at the time of the act did not indicate any departure from normal and if clinical examination after recovery failed to reveal a significant disorder, the person was classified as 'no formal psychiatric illness'. For suicide, positive evidence was required, and in the absence of this the person was coded 'no formal psychiatric illness'.

‡ For both attempted suicides and suicides, the most prominent feature was coded, e.g., where a person suffered from alcoholism, drug addiction, and subnormality, if alcoholism was the most prominent feature he was coded as such. For the diagnosis of personality disorder the important features considered were the presence or absence of persistent disturbances of interpersonal relationships or instability of mood. Character disorder was coded where the predominant distress of the person's situation fell upon himself, and sociopathy when it fell upon society. In the absence of positive evidence, the person was regarded as a normal personality.

TABLE VI

PSYCHIATRIC FACTORS DIFFERENTIATING ATTEMPTED SUICIDES (N = 1141) AND SUICIDES (N = 106)

Factor	Attempted Suicides		Suicides		Significance of Difference between Attempted Suicides and Suicides	
	Males %	Females %	Males %	Females %		
Previous in-patient psychiatric treatment	29·6	25·7	34	48	Males	n.s.
Not known	2·7	1·4	—	—	Females	P<0·005
Previous out-patient psychiatric treatment	27·7	29·4	41·1	50	Males	P<0·005
Not known	2·1	1·8	—	—	Females	P<0·001
Abuse of alcohol	38·6	12·6	54·0	36	Males	P<0·05
Not known	3·0	0·8	1·7	—	Females	P<0·001
Psychiatric diagnosis						
No former psychiatric illness	46·7	43·5	7·1	0		
Depression	33·7	42·5	80·4	90	Males	P<0·001
Other	5·8	4·7	9·0	10	Females	P<0·001
Not known	13·8	9·3	3·5	—		
Personality diagnosis						
Normal	30·0	46·6	10·7	12		
Personality disorder	52·0	44·4	48·2	68	Males	P<0·001
Drug addiction/alcoholism	11·3	1·7	35·7	20	Females	P<0·001
Not known	6·7	7·3	5·4	—		

COMPARISON OF ATTEMPTED SUICIDES, SUICIDES (PA), AND SUICIDES (NPA)

The suicides (PA) or 'overlap' comprised 50 (47%) of the total suicides*.

SEX AND AGE DISTRIBUTION Attempted suicides were mainly females while the sexes were more evenly distributed in both groups of suicides. The difference was significant ($\chi^2 = 9{\cdot}9$; df = 2; $P < 0{\cdot}01$) (Table VII). Attempted suicides were characteristically young while both groups of suicides were older, and similar to each other in age distribution. Although the male suicides (PA) appeared to carry a higher proportion of cases under 45 years than the suicides (NPA), the difference was not significant ($\chi^2 = 1{\cdot}87$; df = 1) (Table VII).

SOCIAL AND PSYCHIATRIC FACTORS The two groups of suicides were similar in having a high proportion of widowed, separated, or divorced persons, but the attempted suicides were more often single.

The 'overlap' resembled the attempted suicides in household composition. The majority in both groups lived with either their spouse or other relatives or friends, while the suicides (NPA) more often lived alone. The 'overlap' contained the highest proportion of unemployed or retired males, those with a criminal record, and the majority of those who drank to excess. Nearly three-quarters of the 'overlap' had received psychiatric inpatient treatment compared with only a small proportion in each of the other two groups.

The great majority of cases in both suicide groups suffered from personality disorder. However, the type of disorder differed in the 'overlap', the predominant diagnoses being sociopathy, drug addiction, and alcoholism, while character neurosis was the principal diagnosis in the suicides (NPA). By comparison, the attempted suicides showed a high content of normal personalities (Table VIII).

At the time of the act, 45% of the attempted suicides showed 'no formal psychiatric illness' while 86% of the 'overlap' and 84% of the suicides (NPA) were depressed.

* To obtain this information the RPTC, general practitioner, and psychiatric hospital records, where relevant, were screened for evidence of a non-fatal act of deliberate self-poisoning or self-injury, whether or not admitted to hospital, occurring at any time during the person's lifetime.

TABLE VII

AGE AND SEX DISTRIBUTION: ATTEMPTED SUICIDES, SUICIDES (PA), AND SUICIDES (NPA)

Age Group	Attempted Suicides				Suicides (PA)				Suicides (NPA)			
	M	(%)	F	(%)	M	(%)	F	(%)	M	(%)	F	(%)
<45	316	(73)	542	(76·6)	11	(45·8)	4	(15·4)	9	(28·1)	5	(20·8)
45+	117	(27)	166	(23·4)	13	(54·2)	22	(84·6)	23	(71·9)	19	(79·2)
All ages	433	(100)	708	(100)	24	(100)	26	(100)	32	(100)	24	(100)

χ^2 (males <45/45+) 34·0; df = 2 P<0·001
χ^2 (females <45/45+) 80·8; df = 2 P<0·001

TABLE VIII

SOCIAL AND PSYCHIATRIC FACTORS DIFFERENTIATING ATTEMPTED SUICIDES (N = 1141), SUICIDES (PA) (N = 50), AND SUICIDES (NPA) (N = 56)

Factor	Attempted Suicides %	Suicides (PA) ('Overlap') %	Suicides (NPA) %	Significance of Variation
Civil state				
Single	35·6	14·0	19·6	
Married	43·7	46·0	35·7	P<0·001
Separated, widowed or divorced	20·1	40·0	44·6	
Not known	0·6	—	—	
Household composition				
Alone	9·1	20·0	41·1	
Spouse	37·7	44·0	33·9	P<0·001
Other	51·2	36·0	25·0	
Not known	2·0	—	—	
Unemployment/retirement				
Males 16-65 yr only	42·8	74·7	53·6	P<0·025
Criminal record	16·6	28·0	5·4	P<0·01
Not known	5·3	2·0	5·4	
Excess use of alcohol	22·4	68·0	25·0	P<0·001
Not known	1·5	—	1·7	
Previous in-patient psychiatric treatment	27·2	74·0	10·8	P<0·001
Not known	1·9	—	—	
Personality diagnosis				
Normal	40·3	4·0	17·8	
Personality disorder (including drug addiction and alcoholism)	52·6	96·0	76·8	P<0·001
Not known	7·1	—	5·4	

METHOD The numbers were insufficient to verify the differences statistically. Drugs were used by the vast majority of the attempted suicides (95%), by three-quarters of the 'overlap' (74%), and by only half the suicides (NPA) (53·6%) to commit the act. However, the type of drugs differed. Both groups of suicides used barbiturates while the attempted suicides used non-barbiturate drugs. In association with the act, 44% of the 'overlap' took alcohol compared with 36·6% of the attempted suicides and 28·6% of the suicides (NPA). The differences were not significant.

DISCUSSION

The study clearly differentiates the two patterns of behaviour in several respects. Attempted suicides greatly outnumbered suicides and, although this is well documented, reports vary due to sampling differences. The present overall ratio of 10·8 : 1 is similar to that reported by Parkin and Stengel (1965) of 9·7 : 1. The age differences shown between the groups concur with the accepted view that attempted suicides are practised by the young, whereas suicides are committed by those of older years. The downward trend in rates among the elderly suicides (65 years and over) is particularly interesting. A rising suicide rate among the elderly, especially males, is more often reported. Suicide in Edinburgh is, therefore, a feature of middle rather than old, age. Scotland as a whole has lower suicide rates among the elderly compared with England (Kreitman, 1972). Although females predominated among the attempted suicides, the ratio of 1·64 : 1 is lower than that reported by other researchers—2·3 : 1 (Farberow and Schneidman, 1961). Interestingly, the suicides showed almost equal parity of the sexes (males to females 1·12 : 1), which contrasts with many parts of Europe and the U.S.A. where males commit suicide in a ratio of 2 or 3 to one female (WHO, 1968). This may reflect cultural differences or changing patterns. Secular trends towards parity of the sexes in both types of behaviour have been noted over the past few years. In Edinburgh, Aitken, Buglass, and Kreitman (1969) demonstrated that in 1962/63 attempted suicides among females greatly outnumbered those among males, but by 1967 the rates were very similar due to a dramatic rise in younger males attempting suicide. The pattern in Edinburgh has remained essentially unchanged since. Similar findings have been reported from other parts of the country (Graham and Hitchens, 1967). Stengel (1964) has pointed out that in England and Wales, since the end of the second world war, the male suicide rate has remained relatively low while the female rate has been rising steadily and is approaching the male rate. Rising suicide rates in both sexes, but particularly in females, have also been noted in Scotland (Kreitman, 1972).

In the younger age groups especially, attempted suicides were mainly single whereas the suicides were more often widowed, separated, or divorced. This is reflected to some extent in the different household compositions. Living alone was more characteristic of the suicides, the principal reason being widowhood followed by separation or divorce. The attempted suicides, on the other hand, lived in the company of others. Loneliness, social isolation, and bereavement have been cited as motives for both types of suicidal behaviour, especially in the older age groups (Batchelor and Napier, 1953; Woodside, 1958; Sainsbury, 1963). Clearly, in the younger age groups, the presence of these factors has a stronger association with suicide than with attempted suicide. Unemployment was more closely associated with male suicides than attempted suicides. At first sight this appears surprising as this characteristic is usually attributed to attempted suicide. However, a high proportion was contained in the suicide (PA) group or 'overlap' which comprised almost half the suicides in this series.

The different patterns of behaviour are also highlighted by the methods used to carry out the act. Drugs were taken almost exclusively by the attempted suicides while coal-gas poisoning and self-injury were more prevalent in the suicides, especially the males. Alcohol in association with the act was more commonly found among male attempted suicides. Suicidal attempts, especially in the younger age groups, are very often impulsive actions, facilitated by alcohol, initiated to escape from a stress situation. The suicide usually initiates the act with intent to die. It is interesting to note that the type of drug used by those attempting suicide in Edinburgh has changed over the past few years. Barbiturates are being used to a lesser extent, being supplanted by the non-barbiturate drugs such as methaqualone, diazepam, nitrazepam, etc. (Aitken *et al.*, 1969). The majority of the suicides still use barbiturates which carry a higher mortality.

Further important differences between the two patterns of behaviour were revealed in the prevalence of psychiatric disturbance. The attempted suicides showed a high proportion of normal personalities and few drug addicts or alcoholics. The reverse was true for the suicides. Half the attempted suicides were psychiatrically well at the time of the act. Only a small proportion had previously received psychiatric treatment. By comparison, the great majority of the suicides were depressed when they committed the act. Many had received previous psychiatric treatment, largely due to the high component of previous attempters in the group.

In contrast to those factors which clearly differentiated them, the two patterns of behaviour showed interesting social and ecological similarities. Both populations were drawn principally from social classes IV and V. In the suicides this held true for males under and over 65 years. Many researchers have found an association between attempted suicide and lower social status, but suicide is more commonly reported in association with the upper social classes in this country, especially in the under 65 age group. After retirement the proportion of deaths in the lower status groups increases (Sainsbury, 1963). Edinburgh seems to resemble America where Farberow and Schneidman (1961) and Schmid and Van Arsdol (1955) have reported the highest suicide rates occurring among the unskilled, semi-skilled, and labouring classes.

Both types of behaviour were shown to originate against a background of social disorganization with high rates in the central parts of the city and also more peripherally in the post-war rehousing areas where families were removed en bloc from the central slum tenements. These areas are characterized by high rates of self-injurious behaviour, overcrowding, juvenile delinquency, referrals to the Royal Society for the Prevention of Cruelty to Children, and other family pathology. The correlations between these factors and both attempted suicide and suicide rates replicate the findings of Kessel (1965) and McCulloch, Philip, and Carstairs (1967) for Edinburgh. The association of these factors with the suicide rates contrasts in some measure with the findings of Sainsbury (1955) for London, and Lester (1970) in Buffalo. Neither found correlations with overcrowding or juvenile delinquency, but, contrary to the present study, Sainsbury noted a correlation with single-person households. The differences may be attributable to the high proportion in the Edinburgh suicide group of those indulging in repeated suicidal behaviour who have a high incidence of social disorganization. Also, Sainsbury's study occurred 17 years ago and referred to even earlier data. Whether these findings are peculiar to Edinburgh can be answered only by further investigations in other areas. Although both attempted suicides and suicides lived in areas characterized by overcrowding, only a small proportion in each group lived in such circumstances.

Intensive screening of all the available records revealed that the suicides (PA) group or 'overlap' comprised almost half (47%) of the suicide group. This figure is considerably in excess of those reported elsewhere in the literature in a series of unselected and consecutive suicides. The differences may be attributable to the admission policy of the RPTC in Edinburgh and to the inclusion of non-hospitalized attempts in the present study. Alternatively, Edinburgh suicides may have a much higher

incidence of previous attempts than other areas. Further research is needed to clarify this point.

The 'overlap' was distinguished by its high content of sociopathy, drug addiction, alcoholism, unemployment, criminal behaviour, and previous inpatient psychiatric treatment. The principal resemblance between the 'overlap' and the attempted suicides lay in the method used to commit the act. Both used drugs, but, whereas the 'overlap' took barbiturates, the attempted suicides preferred non-barbiturate drugs. Otherwise, the attempted suicides were characteristically young single women with a low incidence of pathology.

The suicides (NPA) resembled the 'overlap' in age and sex distribution, in the number of widowed, separated, and divorced, and in the high content of personality disorder and depression at the time of the suicide. Unlike the 'overlap', however, this group more frequently lived alone, used more lethal methods, and suffered from character neurosis rather than sociopathy, drug addiction, or alcoholism. In effect, the suicides (NPA) group exhibited those characteristics often described in association with suicide while the 'overlap' resembled those features associated with high-risk groups among attempted suicides. Stengel (1971) has pointed out that all the adverse social and other factors known to make for a high suicide rate, such as age, social isolation, alcohol and drug abuse, psychiatric illness, etc., are more pronounced among those attempters who kill themselves than among those who do not. Ettlinger (1964) demonstrated the importance of multiple attempts, psychotic symptoms in adult age, criminal convictions, and alcohol as a precipitating agent. Kessel and McCulloch (1966), in their description of a 'repeater' group of attempted suicides in Edinburgh, noted that the highest incidence of suicide occurred among personality disorders, mainly psychopaths with associated drug dependence or alcoholism.

It is concluded, therefore, that in Edinburgh, although both attempted suicides and suicides originate from similar areas where social disorganization is prevalent, the two patterns of behaviour can be differentiated by sex, age, and social and psychiatric disturbance. The 'overlap' more clearly resembles the suicides without previous suicidal behaviour than the attempted suicides, but can be distinguished from both these groups by its high content of sociopathy, drug addiction, alcoholism, unemployment, and criminal behaviour.

SUMMARY

A comparison was made between attempted suicides and suicides occurring contemporaneously among residents in the city of Edinburgh over a period of 18 months, to ascertain the common determinants of both types of behaviour, those factors which differentiate them, and the nature of the 'overlap'. The sample consisted of 1,141 cases of attempted suicide admitted to the Edinburgh Regional Poisoning Treatment Centre and 106 cases of suicide diagnosed by the researcher in accordance with defined criteria. The 'overlap' comprised the 50 suicides who had made a previous attempt (47% of the total suicides).

Attempted suicide occurred more often than suicide, the ratio being 10·8 : 1, and was more frequent among young single persons, predominantly females, who showed little evidence of social or psychiatric disturbance.

Suicide occurred more equally in males and females and was more frequent in middle age, and among the widowed, separated, or divorced, and those with social and psychiatric disturbance. The changing trends in both types of behaviour were discussed.

Both types of behaviour originated from similar areas of the city characterized by high rates of self-injurious behaviour, overcrowding, juvenile delinquency, and other family pathology. Social classes IV and V carried the highest rates in both groups.

The 'overlap' was clearly differentiated from the attempted suicides and those suicides without previous suicidal behaviour by its high content of sociopathy, drug addiction, alcoholism, unemployment, and criminal behaviour.

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REFERENCES

AITKEN, R. C. B., BUGLASS, D., and KREITMAN, N. (1969). The changing pattern of attempted suicide in Edinburgh, 1962-67. *Brit. J. prev. soc. Med.*, **23**, 111.

BATCHELOR, I. R. C., and NAPIER, M. B. (1953). Attempted suicide in old age. *Brit. med. J.*, **2**, 1186.

DORPAT, T. L., and RIPLEY, H. S. (1967). The relationship between attempted suicide and committed suicide. *Comp. Psychiat.*, **8**, 74.

ETTLINGER, R. W. (1964). Suicides in a group of patients who had previously attempted suicide. *Acta psychiat. scand.*, **40**, 363.

FARBEROW, N. L., and SCHNEIDMAN, E. S. (1961). *The Cry for Help*. McGraw-Hill, New York.

GRAHAM, J. D. P., and HITCHENS, R. A. N. (1967). Acute poisoning and its prevention. *Brit. J. prev. soc. Med.*, **21**, 108.

KENNEDY, P. F. (1971). Personal communication.

KESSELL, N. (1965). Self poisoning, part I. *Brit. med. J.*, **2**, 1265.

KESSELL, N., and MCCULLOCH, W. (1966). Repeated acts of self-poisoning and self-injury. *Proc. roy. Soc. Med.*, **59**, 89.

KREITMAN, N. (1972). Suicide in Scotland in comparison with England and Wales. *Brit. J. Psychiat.*, **121**, 83.

LESTER, D. (1970). Social disorganization and completed suicide. *Soc. Psychiat.*, **5**, 175.

MCCULLOCH, J. W., PHILIP, A. E., and CARSTAIRS, G. M. (1967). The ecology of suicidal behaviour. *Brit. J. Psychiat.*, **113**, 313.

OVENSTONE, I. M. K. (1972). A psychiatric approach to the diagnosis of suicide and its effect upon the Edinburgh statistics. *Brit. J. Psychiat.*, (In press).

PARKIN, D., and STENGEL, E. (1965). Incidence of suicidal attempts in an urban community. *Brit. med. J.*, **2**, 133.

PHILIP, A. E., and MCCULLOCH, J. W. (1966). Use of social indices in psychiatric epidemiology. *Brit. J. prev. soc. Med.*, **20**, 122.

REGISTRAR GENERAL (1966). Sample Census, Scotland. H.M.S.O., London.

ROPSCHITZ, D. H., and OVENSTONE, I. M. K. (1968). A two years' survey in self-aggressive acts, suicides and suicidal threats in the Halifax district, 1962-64. *Int. J. soc. Psychiat.*, **14**, 165.

SAINSBURY, P. (1955). *Suicide in London—an Ecological Study*. Chapman and Hall, London.

—— (1963). Social and epidemiological aspects of suicide with special reference to the aged. In: *Processes of Ageing*, Vol. 2, Chap. 36, pp. 153-175, edited by R. H. Williams, C. Tibbitts, and W. Donahue. Atherton Press, New York.

SCHMID, C. F., and VAN ARSDOL, M. D. (1955). Completed and attempted suicide. A comparative analysis. *Amer. Soc. Rev.*, **20**, 273.

STENGEL, E. (1964). *Suicide and Attempted Suicide*. Penguin Books, Harmondsworth.

—— (1971). A survey of follow-up examinations of attempted suicides. Skandia International Symposium on Suicide and Attempted Suicide, Stockholm, 28-30 September.

——, COOK, N. G., and KREEGER I. S. (1958). *Attempted Suicide: Its Social Significance and Effects*. Maudsley Monograph No. 4, Chapman and Hall, London.

WHO (1968). Prevention of suicide. *Wld Hlth Org. Publ. Hlth Pap. No.* 35. W.H.O., Geneva.

WOODSIDE, M. (1958). Attempted suicides arriving at a general hospital. *Brit. med. J.*, **2**, 411.